

fusion and cross circulation on a large scale in rabbits, and have arrived at definite results, negating, in my opinion, beyond all doubt the truth of the doctrine of Pangenesis." If Mr. Galton could have proved that the reproductive elements were contained in the blood of the higher animals, and were merely separated or collected by the reproductive glands, he would have made a most important physiological discovery. As it is, I think every one will admit that his experiments are extremely curious, and that he deserves the highest credit for his ingenuity and perseverance. But it does not appear to me that Pangenesis has, as yet, received its death blow; though, from presenting so many vulnerable points, its life is always in jeopardy; and this is my excuse for having said a few words in its defence.

CHARLES DARWIN

THE NEW HOSPITAL OF ST. THOMAS

II.

THE large wards of the Hospital contained in the several flats of the Blocks 2, 3, 4, 6, and 7* are rooms of noble dimensions. In the second, third, and fourth floors, each ward is more than 100ft. long, 38ft. wide, and 15ft. high; and as this space is designed for the accommodation of twenty-eight patients, each patient will have more than 2,000 cubic feet of air to his own share, irrespective of change by ventilation. But the arrangements for warming and ventilation are also very complete and admirable. The entire building is, in the first instance, warmed to a certain extent by pipes which receive supplies of hot water from large boilers fixed in the basements of each block of building. These heating pipes are expanded into broad radiating coils here and there where immediate increase of warmth is desired. There are two of these radiating coils to each ward. But in addition to these, there are also in each three *open fire-places* situated in the central line of the floor, and sending circular iron chimneys or flues up through the ceiling. These columnar iron chimneys are, however, double. Each has an inner central pipe, and an outer investing sheath. The inner pipe carries up the smoke of the burning fuel; the outer case collects all the effete and used-up air of the chamber, and discharges it with the smoke at the outer orifice above the roof, the central heated pipe being an efficient cause of a steady up-cast. The final outflow of both smoke and impure air is by the square turrets, which are seen from the outside as a part of the ornamental finish of the roof. The fresh air is brought from the outer wall beneath the floors, and is discharged into the wards *through the heated casings* of the fire stoves and radiating coils. This double plan of warming, partly by radiating hot pipes, and partly by open fire places, is the very perfection of efficiency and comfort. Private residences in England are almost always uncomfortable in very cold weather, however liberal may be the consumption of fuel, because the larger and brisker the fires, the more intolerable are the indrafts of cold air. The cylindrical smoke pipes run straight up from basement to roof through the entire series of floors, so that when the flues require cleansing, a kind of plug is removed from the bottom of the pipe, and the entire accumulation

of soot is brought down at once into one of the cellars of the basement, without causing any interference with the comfort or cleanliness of the several wards above.

There are nurses' chambers on either side of the entrance of each large ward; and at each side of the farther end corresponding turrets, or corner rooms, containing lavatories and baths on one side, and closets on the other with convenient little shoots, which are to convey the dust of sweepings and the soiled linen of the patients down at once to the offices in the basements. Near the nurses' chambers there is also a large square lift, worked by hydraulic power, to be used in conveying patients and supplies of all kinds, up and down between the projecting corners, or turrets (at *b b* on the plan). At the further extremity there is a most delicious open-air balcony looking over the cheerful river, with ready access to it from the windows of the wards.

Block No. 9, being designed for the reception of infectious and contagious diseases, is differently planned. There are smaller wards on each side opening from a central stair-case and landing. Between the Blocks 2, 3, and 4, and between 6, 7, and 8 (at *a, a*, on the plan) are low buildings rising in broken and ornamental form from the general line of the connecting corridor, which will be used for the residence of officers of the establishment. Connected with the upper part of these, there is a fine surgeons' operating theatre at each side of the building, one for males and the other for females. These are entered from the light and airy glazed corridor of the second floor, and have retiring-rooms for patient and surgeon, and a direct way to a pleasant open-air flat roof looking out over the river.

In communication with the great connecting corridor there is a perfect maze of offices and conveniences, approached by an accident-receiving porch abutting on the Lambeth Road. There are receiving-rooms for out-patients and for surgical cases and accidents, dispensaries, and a long range of small private rooms for the medical and surgical officers, clerks, and dressers. The Administrative Block, No. 1, is entered from the Westminster Bridge Road by two flights of steps, one leading to the private residence of the Treasurer of the Hospital, and the other to a large Council hall looking out by a balcony upon the river, and to Committee rooms and other offices, which are to be connected with the other departments of the establishment by lines of electric telegraph. The general entrance of the Hospital is from the Lambeth Road, leading to a spacious hall in the central block, No. 5, above which is the Chapel of the Hospital, a vaulted building of fine proportions and very chaste design. This block will be finished towards the river front, where it is set back or recessed from the line of the other blocks, by an ornamented face which looks out on an enclosed space or central court. From this court the prospect to the river is between the pillars of an open colonnade, bearing in the centre a group of sculptured figures, of which the chief will be the statue of Edward the Sixth, the royal founder of the Hospital.

Block No. 9 has much more the appearance of a church, or chapel, than the central building. It is of low elevation, compared with the other blocks, and has ornamental arched windows of large size; and at the corner there is a square tower, half steeple, half pagoda, which

* See plan in NATURE No. 63, p. 202.

is altogether suggestive of a campanile. It is only when the eye is carried along the general range of the buildings, and it is noted that this tower is simply the architect's contrivance for raising the chimney turret in the case of this lower erection to the same height as the chimney turrets of similar aspect on the higher blocks, that the idea dawns upon the observer that this building may have a very different purpose to perform than affording accommodation for religious worship and service. It is, indeed, a temple for the dead rather than for the living. It is properly the Museum and Medical Schools of the Hospital; and the lofty tower will be employed to waft the vapours of effete corporeal mortality well up into the purifying atmosphere. Its interior will be warmed by hot-water warmed air to feed the combustion of the open fires. This evil is entirely obviated by this plan of having half pipes and radiating coils, to cause a strong up-cast; and will gather the air from brick channels of escape which permeate all portions of the building. The most surprising thing about this terminal block of the Hospital is the vast amount of accommodation that has been got out of it by dint of good package and clever arrangement. It looks like a tolerable-sized chapel, and might really be no more, yet it really contains a very capacious Museum, four large Lecture Theatres, a Chemical Laboratory, a Dissecting-room, mortuary chambers, and students' halls. It is, in fact, one of the most commodious and best ordered Medical Schools in the Metropolis.

There is a long tunnelled way under ground, running to the chambers for the dead in this building, from the several Hospital blocks, from one part of which a branch passage leads to the wash-house and laundry. One of the mortuary rooms is to be arranged as a sort of Morgue, or reception room for friends who come to pay a last visit to the dead; and a pair of large gates opening upon the Lambeth Road will admit the hearse to this portion of the Hospital, when it comes to claim those portions of the remnants of vitality that have not found another mode of escape through the campanile tower. This "old mortality" end of the Hospital nestles curiously close under spiritual over-shadowing. It is only separated from the battlements of the Archbishop's palace at Lambeth by the stables and coach-house of the Treasurer of the Hospital.

The new Hospital of St. Thomas promises to be one of the most complete and efficient of the hospitals and medical schools of the metropolis. R. J. M.

ZOOLOGICAL TEXT-BOOKS

General Outline of the Organisation of the Animal Kingdom and Manual of Comparative Anatomy. By Prof. Rymer Jones, F.R.S. (Van Voorst.) Fourth Edition. 1871.

A Manual of Zoology for Students. By Dr. Henry Alleyne Nicholson. (W. Blackwood and Sons) 1870.

THE mass of information which is continually and rapidly accumulating in every department of Natural Science, renders it increasingly desirable that every manual writer should zealously aim at combining terseness with accuracy, and, by a well-chosen selection of the most important facts, exhibit the results of the more recent acquisitions of science. In the ponderous volume of 886 pages,

which now replaces the long-known "Comparative Anatomy" of Prof. Rymer Jones, the very opposite characters are painfully conspicuous, and we sincerely pity the student who has recourse to it for his instruction in zootomy. Not but what the book is both highly instructive and interesting, and exhibits conspicuously the learning, patience, and zeal of its accomplished author. For all this, however, the youth who gets up his zoology and comparative anatomy from it, will find himself out of joint with and wanting, as regards the zootomy of the present day, while he will have wasted time over comparatively useless and antiquated details.

The Rotifera are, indeed, strangely located, being described in one chapter with all the Crustacea except the Cirripeds, which latter are placed apart in a separate chapter. A still more important defect, however, and one almost incredible, is the complete omission of all reference to the Rhizocephala. After this it is not surprising that no notice is taken of those recent discoveries as to larval Ascidians, which seem to indicate a genetic affinity between them and the Vertebrata, and which are now made familiar to all by Mr. Darwin's "Descent of Man." This is the more remarkable, as at p. 666 the author speaks of the Amphioxus as in some respects resembling Ascidians, and being thus connected with the Mollusca. Another singular and conspicuous blot is the location of the Brachiopoda between the Lamellibranchiata and the Gasteropoda.

When we come to the great Vertebrate division of the animal kingdom, we are again painfully impressed by defects and shortcomings, which sometimes must lead to downright error on the part of the unlearned reader.

The Batrachians are lumped together with the true Reptiles in one class, and the student could hardly gather from Prof. Rymer Jones's pages that the true affinities of the former are with fishes, while the latter are closely related to birds. In the general index we read "Comparison between Birds and Reptiles, p. 760, sec. 2,032." We turn to the page and section indicated, expecting to find a succinct statement of the results arrived at by Profs. Huxley and Cope. In reality we find but a meagre statement of the obvious physiological contrasts between the two classes.

Owen's hypotheses as to the essential nature of the vertebrate endoskeleton and its several parts, are given without criticism or discrimination, as if they were views universally received and recognised. But there are positive errors which it is difficult to stigmatise too strongly. Thus, in spite of Prof. Huxley's papers, it is gravely asserted of the terminal caudal vertebræ of homocercal fishes, that they "are commonly blended together, and shortened by absorption, whilst both neural and hæmal arches remain with increased vertical extent, and indicate the number of the metamorphosed and obliterated centra!"

Of Prof. Owen's hæmal cranial arches, it is said that his labours "have satisfactorily revealed their real nature, and established *beyond a doubt* (the italics are ours) the alliances which exist between the elaborate structures in question and the arches which exist under singular conditions appended to the vertebral segments of the trunk."

At the other end of the skeleton all the valuable re-